CLAIMS:

1. An apparatus for facilitating transdermal delivery of therapeutic substances, said apparatus comprising:

means for producing an electromagnetic field;

control means arranged to control said field producing means to alternately produce active and substantially inactive electromagnetic field portions, each said active electromagnetic field portion including an electromagnetic field packet having a plurality of successive electromagnetic field pulses, and each said substantially inactive electromagnetic field portion including no electromagnetic field pulses;

wherein during use when the electromagnetic field is incident on a patient, dermal permeability is increased.

2. Apparatus as claimed in claim 1, wherein the means for producing an electromagnetic field comprises a solid state switching device.

3. Apparatus as claimed in claim 2, wherein the control means is arranged to produce an energisation signal useable to control switching of the solid state switching device, each energisation signal packet including an active energisation signal portion including a plurality of energisation signal pulses and a substantially inactive energisation signal portion including no signal pulses.

4. Apparatus as claimed in claim 3, wherein at least some of the signal pulses are of generally rectangular configuration.

5. Apparatus as claimed in any one of the preceding claims, wherein the means for producing an electromagnetic field includes a coil.

6. Apparatus as claimed in any one of claims 2 to 4, wherein the solid state switching device comprises a transistor.

7. Apparatus as claimed in any one of the preceding claims, wherein the control means comprises a microcontroller.

8. Apparatus as claimed in claim 7, wherein the microcontroller is programmable by a user so that an electromagnetic signal corresponding to a predetermined therapeutic substance delivery plan is produced.

9. Apparatus as claimed in claim 8, wherein the microcontroller is programmed such that during use dermal permeability is increased at one or more specific times.

10. Apparatus as claimed in claim 8 or claim 9, wherein the microcontroller is programmed such that during use dermal permeability is increased for a specific period of time.

11. Apparatus as claimed in any one of the preceding claims, wherein the energisation signal packet repeats at a frequency of between 1Hz and 100Hz.

12. Apparatus as claimed in claim 11, wherein the energisation signal packet repeats at a frequency of between 10Hz and 50Hz.

13. Apparatus as claimed in any one of the preceding claims, wherein each energisation signal packet includes between 12 and 20 energisation signal pulses.

14. Apparatus as claimed in any one of the preceding claims, wherein the duration of each energisation pulse is between 1μs and 1s.

15. Apparatus as claimed in claim 11, wherein the duration of each energisation pulse is between 25μs and 100ms.

16. Apparatus as claimed in any one of the preceding claims, wherein the apparatus comprises a substantially flat member having the means for producing an electromagnetic field and the control means embedded therein.

17. Apparatus as claimed in any one of the preceding claims, wherein the therapeutic substance is disposed on an outwardly facing surface of the apparatus.

18. Apparatus as claimed in any one of the preceding claims, wherein the therapeutic substance is a drug, vaccine, ion, macromolecule, DNA fragment or gene.

19. A method of transdermally delivering therapeutic substances, said method comprising:

producing an electromagnetic field;

directing the electromagnetic field at a desired treatment area of a patient's skin; and

controlling the electromagnetic field so as to alternately produce active and substantially inactive electromagnetic field portions, each said active electromagnetic field portion including an electromagnetic field packet having a plurality of successive electromagnetic field pulses, and each said substantially inactive electromagnetic field portion including no electromagnetic field pulses.

20. A method as claimed in claim 19, wherein the step of controlling the electromagnetic field comprises producing an energisation signal useable to control switching of a solid state switching device, each energisation signal

packet including an active energisation signal portion including a plurality of energisation signal pulses and a substantially inactive energisation signal portion including no signal pulses.

21. A method as claimed in claim 20, wherein at least some of the signal pulses are of generally rectangular configuration.

22. A method as claimed in any one of claims 19 to 21, wherein the step of producing an electromagnetic field comprises energizing a coil.

23. A method as claimed in claim 20 or claim 21, wherein the solid state switching device comprises a transistor.

24. A method as claimed in any one of claims 19 to 22, wherein the control means comprises a microcontroller.

25. A method as claimed in claim 24, further comprising the step of programming the microcontroller so that during use an electromagnetic signal corresponding to a predetermined therapeutic substance delivery plan is produced.

26. A method as claimed in claim 25, further comprising the step of programming the microcontroller such that during use dermal permeability is increased at one or more specific times.

27. A method as claimed in claim 25 or claim 26, further comprising the step of programming the microcontroller such that during use dermal permeability is increased for a specific period of time.

28. A method as claimed in any one claims 19 to 27, wherein the energisation signal packet repeats at a frequency of between 1Hz and 100Hz.

29. A method as claimed in claim 28, wherein the energisation signal packet repeats at a frequency of between 10Hz and 50Hz.

30. A method as claimed in any one of claims 19 to 29, wherein each energisation signal packet includes between 12 and 20 energisation signal pulses.

31. A method as claimed in any one of claims 19 to 30, wherein the duration of each energisation pulse is between 1μs and 1s.

32. A method as claimed in claim 31, wherein the duration of each energisation pulse is between 25μs and 100ms.

33. A method as claimed in any one of claims 19 to 32, wherein the therapeutic substance is a drug, vaccine, ion, macromolecule, DNA fragment or gene.